

International Union of Pure and Applied Chemistry



# Compendium of Chemical Terminology

IUPAC RECOMMENDATIONS

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*b*

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Science

APPENDIX B

**conversion, internal**See *internal conversion*.

O.B. 101

**conversion spectrum**

A plot of a quantity related to the absorption (absorbance, cross section, etc.) multiplied by the quantum yield for the considered process against a suitable measure of photon energy, such as frequency,  $\nu$ , wavenumber,  $\sigma$ , or wavelength,  $\lambda$ , e.g. the conversion cross section,  $\sigma\phi$ , has the SI unit  $\text{m}^2$ .

See also *action spectrum*, *efficiency spectrum*, *spectral effectiveness*.

1996, 68, 2234

**converter, wavelength**See *wavelength converter*.

1995, 67, 1758

**co-oligomer**

An *oligomer* derived from more than one species of *monomer*.

1996, 68, 2300

**co-oligomerization**

*Oligomerization* in which a *co-oligomer* is formed.

1996, 68, 2306

**cooling, radioactive**See *radioactive cooling*.

1982, 54, 1538

**cooperative transition**

A transition that involves a simultaneous, collective displacement or change of state of the atoms and/or electrons in the entire system.

Examples:

An *order-disorder transition* of atoms or electrons, as in an alloy, a ferromagnet or superconductor; a *Jahn-Teller* or *ferroic transition*; a *martensitic transition*.

1994, 66, 580

**cooperativity**

Interaction between the *substrate* binding sites of an *allosteric enzyme*. Binding of a substrate molecule to one binding site changes the affinity of the binding sites on the other subunits (cf. *allosteric enzymes*) to the substrate by induction of a conformation change at the other binding sites. Cooperative enzymes typically display a sigmoid (S-shaped) plot of the reaction rate against substrate concentration.

1992, 64, 151

**coordinate covalence**See *coordination*.

1994, 66, 1100

**coordinate covalence (coordinate link)**See *coordination*.

1994, 66, 1100

**coordinate link**See *coordination*.

1994, 66, 1100

**coordination**

The formation of a *covalent bond*, the two shared electrons of which have come from only one of the parts of the *molecular entity* linked by it, as in

the reaction of a Lewis acid and a Lewis base to form a Lewis adduct; alternatively, the bonding formed in this way. In the former sense, it is the reverse of *unimolecular heterolysis*. 'Coordinate covalence' and 'coordinate link' are synonymous (obsolescent) terms. The synonym 'dative bond' is obsolete.

(The origin of the bonding electrons has by itself no bearing on the character of the bond formed. Thus, the formation of methyl chloride from a methyl cation and a chloride ion involves coordination; the resultant bond obviously differs in no way from the C-Cl bond in methyl chloride formed by any other path, e.g. by colligation of a methyl radical and a chlorine atom.) The term is also used to describe the number of ligands around a central atom without necessarily implying two-electron bonds.

See also *dipolar bond*,  $\pi$ -*adduct*.

1994, 66, 1100

**coordination entity**

An assembly consisting of a central atom (usually metallic) to which is attached a surrounding array of other groups of atoms (ligands).

R.B. 145

**coordination number**

1. The coordination number of a specified atom in a *chemical species* is the number of other atoms directly linked to that specified atom. For example, the coordination number of carbon in methane is four, and it is five in protonated methane,  $\text{CH}_5^+$ . (The term is used in a different sense in the crystallographic description of ionic crystals.)

1994, 66, 1100

2. In an inorganic coordination entity, the number of sigma bonds between ligands and the central atom. Pi-bonds are not considered in determining the coordination number.

R.B. 146

**coordination polyhedron (polygon)**

In a coordination entity, the solid figure defined by the positions of the ligand atoms directly attached to the central atom.

R.B. 146

**coordinatively saturated complex**

A transition metal complex that has formally 18 outer shell electrons at the central metal atom.

1994, 66, 1100

**coordinatively unsaturated complex**

A transition metal complex that possesses fewer ligands than exist in the coordinatively saturated complex. These complexes usually have fewer than 18 outer shell electrons at the central metal atom.

1994, 66, 1100

**copolymer**

A *polymer* derived from more than one species of *monomer*.

Note:

Copolymers that are obtained by *copolymerization* of two monomer species are sometimes termed bipo-

**counter-ions**

1. (in an ion exchanger): the mobile exchangeable ions.

1993, 65, 854

2. (in colloid chemistry): ions of low relative molecular mass, with a charge opposite to that of the colloidal ion.

1972, 31, 607

**counter, radiation**

See *radiation counter*.

1982, 54, 1538

**counter tube**

*Radiation detector* consisting of a gas-filled tube or valve whose gas amplification is much greater than one, and in which the individual ionizing events give rise to discrete electrical pulses. Often an expression is added indicating the geometry (e.g. end window), composition of the gas (e.g. helium) or the physical process for its operation (e.g. proton recoil, fission).

1982, 54, 1538

**counter tube, Geiger-Muller**

See *Geiger-Muller counter tube*.

1982, 54, 1538

**counter tube, proportional**

See *proportional counter tube*.

1982, 54, 1538

**counting, absolute**

See *absolute counting*

1994, 66, 2517

**counting efficiency**

The ratio between the number of particles or photons counted with a *radiation counter* and the number of particles or photons of the same type and energy emitted by the *radiation source*.

1994, 66, 2517

**counting loss**

A reduction of the *counting rate* resulting from phenomena such as the resolving time or the *dead time*.

1994, 66, 2517; O.B. 217

**counting rate**

The number of *counts* occurring in unit time.

1994, 66, 2517

**coupled (indicator) reaction (in analysis)**

A reaction which follows the (slower) reaction of kinetic interest, so as to provide means of monitoring the formation of a reaction product. This reaction is sometimes referred to as the *indicator reaction*.

1993, 65, 2294

**coupled simultaneous techniques (in analysis)**

The application of two or more techniques to the same sample when the two instruments involved are connected through an interface, e.g. simultaneous thermal analysis and mass spectrometry.

O.B. 39

**coupling**

See *chemical induction*.

1996, 68, 162

**coupling constant (spin-spin),  $J$** 

A quantitative measure for nuclear spin-spin, nuclear-electron (hyperfine coupling) and electron-electron (fine coupling in EPR) coupling in magnetic resonance spectroscopy. The 'indirect' or scalar NMR coupling constants are in a first approximation independent of the external magnetic field and are expressed in Hz.

1994, 66, 1101

**covalent bond**

A region of relatively high electron density between nuclei which arises at least partly from sharing of electrons and gives rise to an attractive force and characteristic internuclear distance.

See also *agostic*, *coordination*, *hydrogen bond*, *multi-centre bond*.

1994, 66, 1101

**covalent network**

See *network*.

1996, 68, 2298

**Cox-Yates equation**

A modification of the *Bunnett-Olsen equation* of the form:

$$\lg ([SH^+]/[S]) - \lg [H^+] = m^*X + pK_{SH^+}$$

where  $X$  is the activity function  $\lg (\gamma_S \gamma_{H^+} / \gamma_{SH^+})$  for an arbitrary reference base. The function  $X$  is called the excess acidity because it gives a measure of the difference between the acidity of a solution and that of an ideal solution of the same concentration. In practice  $X = -(H_0 + \lg [H^+])$  and  $m^* = 1 - \Phi$ .

See also *Bunnett-Olsen equation*.

1994, 66, 1101

**cracking**

The thermal or catalytic decomposition of a compound such as a hydrocarbon into chemical species of smaller molecular weight.

1990, 62, 2183

**cream**

A highly concentrated *emulsion* formed by *creaming* of a dilute emulsion.

1972, 31, 611

**creaming**

The macroscopic separation of a dilute *emulsion* into a highly concentrated emulsion, in which interglobular contact is important, and a continuous phase under the action of gravity or a centrifugal field. This separation usually occurs upward, but the term may still be applied if the relative densities of the dispersed and continuous phases are such that the concentrated emulsion settles downward.

1972, 31, 611

**cream volume**

The volume of *cream* formed in an *emulsion*.

1972, 31, 616